I Claim:

1. A heat engine having a region within which a working fluid travels and an output system including hydraulic fluid which is provided in a reservoir whereby the heat engine produces power which is used to pump the hydraulic fluid.

2. The heat engine as claimed in claim 1 wherein the reservoir is open to the region within which a working fluid travels whereby the working fluid directly contacts the hydraulic fluid to pump the hydraulic fluid.

3. The heat engine as claimed in claim 1 wherein the hydraulic fluid is silicone oil.

4. The heat engine as claimed in claim 1 wherein the flow of hydraulic fluid into and out from the reservoir is tangential.

5. The heat engine as claimed in claim 1 wherein the flow of hydraulic fluid into the reservoir is tangential and the flow of hydraulic fluid out from the reservoir is axial.

6. The heat engine as claimed in claim 1 wherein the flow of hydraulic fluid into the reservoir is axial and the flow of hydraulic fluid out from the reservoir is tangential.

7. The heat engine as claimed in claim 1 wherein the working fluid and the hydraulic fluid are each pressurized to a pressure above atmospheric pressure.

8. The heat engine as claimed in claim 1 wherein the working fluid and the hydraulic fluid are each pressurized which is greater than atmospheric pressure.

9. The heat engine as claimed in claim 1 wherein the hydraulic fluid travels through a circuit that includes an accumulator positioned upstream and downstream from a fluid driven motor.

10. The heat engine as claimed in claim 9 wherein the fluid driven motor has a rotary output.

11. The heat engine as claimed in claim 10 wherein the accumulators and the fluid driven motor are integrated into a single housing to thereby provide a rotary output system which employs fluid seals and does not require gas seals.

12. The heat engine as claimed in claim 1 wherein the sealed region has a heating chamber and a cooling chamber and the hydraulic fluid travels through a circuit that includes a heat exchange portion exterior to the cooling chamber whereby the hydraulic fluid is employed to remove heat from the cooling chamber.

13. The heat engine as claimed in claim 12 wherein the circuit that includes an accumulator positioned upstream and downstream from a fluid driven motor and the heat exchange portion is part of a single flow line.

14. The heat engine as claimed in claim 1 wherein the hydraulic fluid travels through a circuit that includes an accumulator positioned upstream and downstream from a fluid driven motor and a

radiator is provided in the circuit to remove excess heat from the engine.

15. The heat engine as claimed in claim 14 wherein the radiator is positioned downstream of the reservoir

16. A heat engine having a region within which a working fluid travels and a heat source, the region has a heating chamber and a cooling chamber, the heat source is thermally connected to the heating chamber, and louvred fins are positioned in the heating chamber whereby the louvred fins transfer heat from the heat source to the working fluid as the working fluid travels through the louvred fins.

17. A heat engine having a region within which a working fluid travels and a combustion chamber, the region has a heating chamber and a cooling chamber and an outer wall, the combustion chamber is thermally connected to the heating chamber, and a heat exchanger provided exterior to a portion of the outer wall, the heat exchanger having first and second annular fluid flow passageways, each passageway has an outer wall secured in place by mechanical engagement by a plurality of spaced apart fins that extend across the respective fluid flow passageway.

18. An hydraulic pump in fluid flow communication with a heat engine to be driven by a periodic pulse produced by the heat engine wherein the fluid travels through a path that includes a reservoir and the flow of hydraulic fluid into the reservoir is axial and the flow of hydraulic fluid out from the reservoir is tangential.

19. An hydraulic pump in fluid flow communication with a heat engine to be driven by a periodic pulse produced by the heat engine wherein the fluid travels through a path that includes a reservoir and the flow of hydraulic fluid into and out from the reservoir is tangential.

20. An hydraulic pump in fluid flow communication with a heat engine to be driven by a periodic pulse produced by the heat engine wherein the fluid travels through a path that includes a reservoir and the flow of hydraulic fluid into the reservoir is tangential and the flow of hydraulic fluid out from the reservoir is axial.

[Received by the Internationnal Bureau on 18 July 2002 (18.07.2002)
original claims 1-20 replaced by amended claims 1-20

I Claim:

1. A heat engine having a region within which a working fluid travels and an output system including a chamber having a liquid inlet and a liquid outlet, whereby the heat engine produces power which is used to sequentially draw liquid into the inlet to the chamber and to then pump the liquid out of the outlet.

2. The heat engine as claimed in claim 1 wherein the chamber is open to the region within which a working fluid travels whereby the working fluid directly contacts the liquid to pump the liquid.

3. The heat engine as claimed in claim 1 wherein the liquid is silicone oil.

4. The heat engine as claimed in claim 1 wherein the flow of liquid into and out from the reservoir is tangential.

5. The heat engine as claimed in claim 1 wherein the chamber is a liquid reservoir and the flow of liquid into the reservoir is tangential and the flow of liquid out from the reservoir is axial.

6. The heat engine as claimed in claim 1 wherein the chamber is a liquid reservoir and the flow of liquid into the reservoir is axial and the flow of liquid out from the reservoir is tangential.

7. The heat engine as claimed in claim 1 wherein the chamber is a liquid reservoir, the liquid travels in a circuit and the working fluid and the liquid are each pressurized to a pressure above atmospheric pressure.

8. The heat engine as claimed in claim 1 wherein the chamber is a liquid reservoir, the liquid travels in a circuit and the working fluid and the liquid are each pressurized which is greater than atmospheric pressure.

9. The heat engine as claimed in claim 1 wherein the liquid travels through a circuit that includes an accumulator positioned upstream and downstream from a fluid driven motor.

10. The heat engine as claimed in claim 9 wherein the fluid driven motor has a rotary output.

11. The heat engine as claimed in claim 10 wherein the accumulators and the fluid driven motor are integrated into a single housing to thereby provide a rotary output system which employs fluid seals and does not require gas seals.

12. The heat engine as claimed in claim 1 wherein the sealed region has a heating chamber and a cooling chamber and the liquid travels through a circuit that includes a heat exchange portion exterior to the cooling chamber whereby the liquid is employed to remove heat from the cooling chamber.

13. The heat engine as claimed in claim 12 wherein the circuit that includes an accumulator positioned upstream and downstream from a fluid driven motor and the heat exchange portion is part of a single flow line.

14. The heat engine as claimed in claim 1 wherein the liquid travels through a circuit that includes an accumulator positioned upstream and downstream from a fluid driven motor and a radiator is provided in the circuit to remove excess heat from the engine.

15. The heat engine as claimed in claim 14 wherein the radiator is positioned downstream of the reservoir

16. A heat engine having a region within which a working fluid travels and a heat source, the region has a heating chamber and a cooling chamber, the heat source is thermally connected to the heating chamber, and louvred fins are positioned in the heating chamber whereby the louvred

fins transfer heat from the heat source to the working fluid as the working fluid travels through the louvred fins.

17. A heat engine having a region within which a working fluid travels and a combustion chamber, the region has a heating chamber and a cooling chamber and an outer wall, the combustion chamber is thermally connected to the heating chamber, and a heat exchanger provided exterior to a portion of the outer wall, the heat exchanger having first and second annular fluid flow passageways, each passageway has an outer wall secured in place by mechanical engagement by a plurality of spaced apart fins that extend across the respective fluid flow passageway.

18. An hydraulic pump in fluid flow communication with a heat engine to be driven by a periodic pulse produced by the heat engine wherein the fluid travels through a path that includes a reservoir and the flow of fluid into the reservoir is axial and the flow of fluid out from the reservoir is tangential.

19. An hydraulic pump in fluid flow communication with a heat engine to be driven by a periodic pulse produced by the heat engine wherein the fluid travels through a path that includes a reservoir and the flow of fluid into and out from the reservoir is tangential.

20. An hydraulic pump in fluid flow communication with a heat engine to be driven by a periodic pulse produced by the heat engine wherein the fluid travels through a path that includes a reservoir and the flow of hydraulic fluid into the reservoir is tangential and the flow of hydraulic fluid out from the reservoir is axial.